ABSTRACT

A method and system is provided for registering a 2D radiographic image of a target with previously generated 3D scan data of the target. A reconstructed 2D image is generated from the 3D scan data. The radiographic 2D image is registered with the reconstructed 2D images to determine the values of in-plane transformation parameters (x, y, θ) and out-of-plane rotational parameters (r, φ), where the parameters represent the difference in the position of the target in the radiographic image, as compared to the 2D reconstructed image. An initial estimate for the in-plane transformation parameters is made by a 3D multi-level matching process, using the sum-of-square differences similarity measure. Based on these estimated parameters, an initial 1-D search is performed for the out-of-plane rotation parameters (r, φ), using a pattern intensity similarity measure. The in-plane parameters (x, y, θ) and the out-of-plane parameters (r, φ) are iteratively refined, until a desired accuracy is reached.